

known art that describes a 2-wheel skateboard having independent rear steering.

4. Applicant submits that it was non-obvious whether the swivel-steering/single-wheels combination would be rideable, much less enjoyable to ride. Given the long learning curve required, a person of "ordinary skill in the art" would not have been persistent enough to determine the true utility of the device.
5. Directly combining Yu and Namiki is not possible since the desired position of the steering pivot interferes with the single wheel of each footboard assembly.
6. The combination of swivel-steering and single wheels without further refinement (i.e. the swiveling strut) yields poor steering dynamics, but this would not be obvious to a person of "ordinary skill in the art" who was trying to learn to ride the device.
7. Sheldon's "torsion bar" is not suggestive since its purpose is altogether different. The present invention provides independent front/rear steering and a small turning radius already, without the addition of the swiveling strut.
8. The present invention fulfills an unrecognized need for a skateboard having a novel form of movement and that is interesting to ride at relatively safe speeds, in small areas, and on common terrain (i.e. no need for ramps, rails etc). An additional unrecognized need is for a skateboard sufficiently maneuverable to play multi-player games.
9. The present invention has surprising, unexpected and advantageous attributes: Firstly, it solves a major problem of steering instability inherent in the conventional "Snakeboard", and secondly it is more graceful and fun to ride.

The detailed arguments are as follows:

1. The Applicant's filing date is April 11, 2001. The issue date for Namiki (6,428,022) is August 6, 2002. Applicant is aware of no publication date for the Namiki invention prior to the issue date. Unless there was publication prior to Applicant's filing date, then Applicant clearly could not have benefited from the Namiki art. If an earlier date exists and precedes the Applicant's filing date, then the Applicant will provide additional documentation to prove the date at which his first prototype was built.
2. To paraphrase the Examiner's argument: "Yu has 4-wheels and direct-coupled swivel-steering. Namiki has two wheels but uses tilt-steering (sprung or gravity-centered casters). Combining the two-wheel feature with the swivel-steering feature would be obvious..."

For clarity, this argument is shown pictorially in Figure 1.

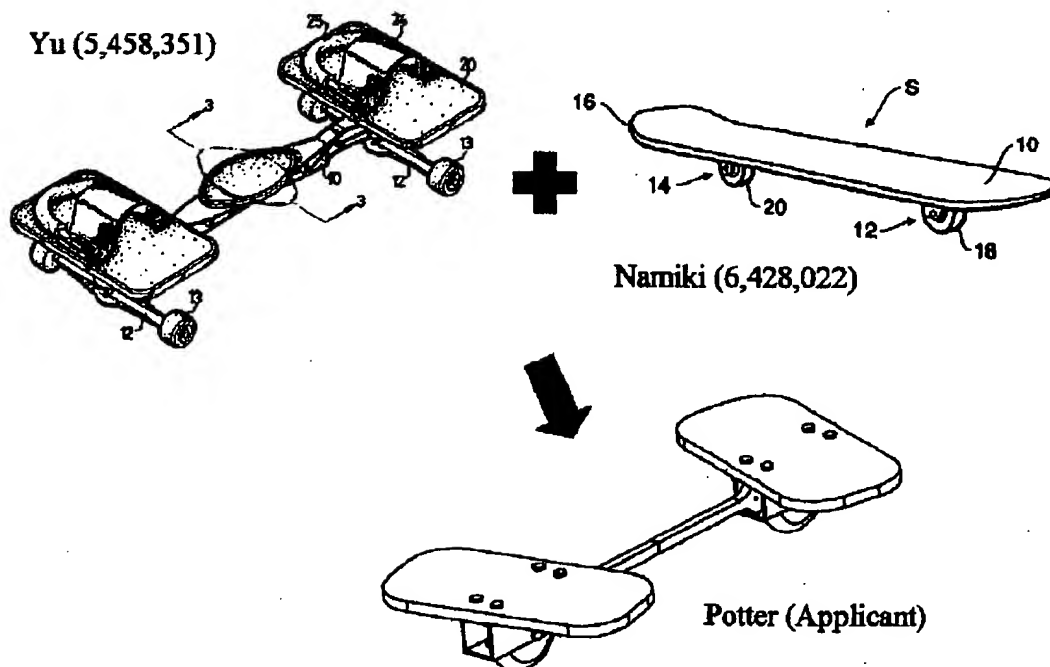


Figure 1: Examiner's Argument for rejection under 35 USC 103(a)

Applicant respectfully submits that this argument is inconsistent with several of the most important skateboard patents in recent history. Consider, for instance the fundamental "Snakeboard" patent: Smith et al (4,955,626). Smith is used here in place of Yu since Yu's device is a minor "improvement" over Smith. Smith's invention, known as the "Snakeboard" is the most commercially successful skateboard invention since the standard skateboard (i.e. 4-wheels and "trucks").

Ten years prior to Smith et al, Piazza (4,202,559) created a skateboard with swivel-steering of the front wheel. Smith's invention was to apply the same steering method to both fore and aft wheels. However, there was already precedent for having independently steered front and rear wheel-sets: Sheldon's "torsion-bar" skateboard. By the Examiner's logic, Smith's skateboard an obvious combination of Sheldon and Piazza (see Figure 2).

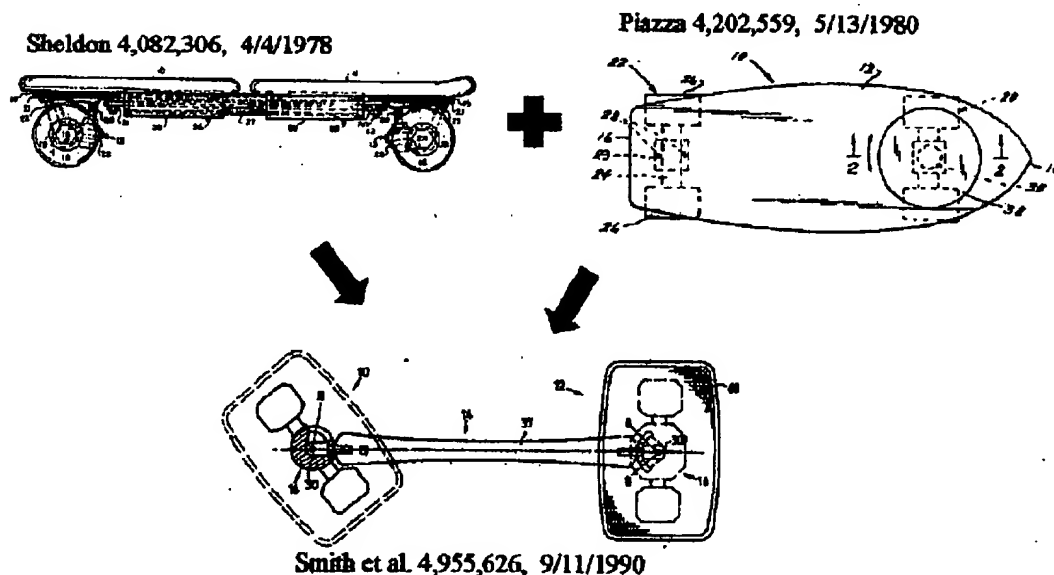


Figure 2: Examiner's logic applied to Smith et al in view of Sheldon and Piazza

Namiki's invention also does not pass this test. Barachet's invention (5,160,155) describes a 2-wheeled skateboard having a tilt-sensitive caster in the front. Namiki applies this type of steering to both front and rear wheels. By the

Examiner's logic, Namiki's invention, in which Barachet-style steering is applied to both front and rear wheels should be obvious, in view of Piazza, Smith et al, and Barachet. This is illustrated in Figure 3. Note that a conventional skateboard also steers both the front and rear wheel-sets, thus Namiki can also be considered a combination of a conventional skateboard and Barachet.

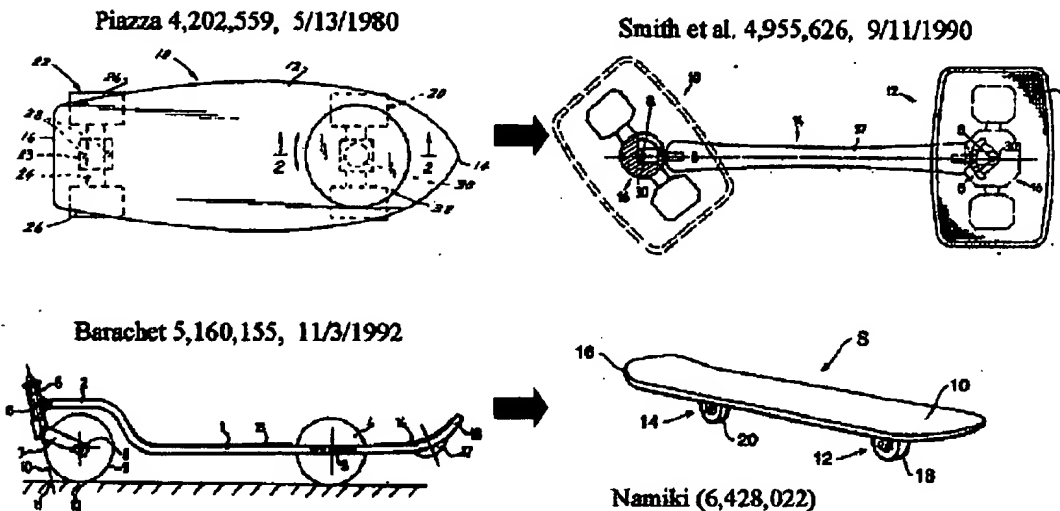


Figure 3: Examiner's logic applied to Namiki in view of Piazza, Smith and Barachet

The purpose of the above examples is not to call into question the patentability of the prior art, but rather to illustrate the standard for non-obviousness within this class of invention. The reasons for the PTO's allowance of the above inventions are probably similar to the arguments submitted herein. Further evidence of non-obviousness is that it took 10 years to get from Piazza to Smith et al, and 10 years to get from Barachet to Namiki.

Applicant respectfully submits that the present invention meets or exceeds the standard of non-obviousness in the skateboard prior art.

3. None of the cited references for 2-wheel skateboards, i.e. Namiki, Tipton, Killian and Attey, have independent rear steering. In fact, only Namiki has rear steering at all, but Namiki's front and rear steering are both controlled primarily by a single control input: tilting the platform. This reduces the difficulty of riding the

board, but also restricts its freedom of movement. Applicant respectfully submits that the addition of wholly independent rear steering in an already unstable 2-wheeled board required a leap of faith as to whether the skateboard would even be rideable. Applicant further submits that the addition of rear steering represents a key advance in maneuverability, efficiency of self-propulsion (without having to directly push off the ground), and the overall satisfaction of mastering the board.

4. Assuming a person were to conceive of combining dual swivel-steering (as in Smith or Yu) with single-wheels, "ordinary" skill in the art would not be sufficient to determine the utility of the device, and without determining utility, the device would have been abandoned. To determine utility, the person needs more than just the ability to build prototypes, he or she needs to be highly coordinated and persistent, and sufficiently observant to the function of the prototypes to make the key refinements that confer utility. In the present invention, Applicant submits that it was not obvious to him whether the device would be rideable, and it took many weeks of practice before he could self-propel the board. A person of ordinary skill in the art would have rejected the concept as inoperable.
5. Applicant respectfully submits that Yu and Namiki cannot be combined without additional modifications which are non-obvious. In the conventional Snakeboard design (i.e. Yu or Smith et al), the steering axis is centered with respect to the footpad and the wheel-set. If the dual-wheel wheel-set is replaced by a single wheel, there is no room for the steering pivot joint. Applicant experimented with various solutions including the use of a large-bore, thin-style bearing between the footpad and the wheel. This solution is undesirable due to excessive cost, weight and reduced wheel-diameter leading to high rolling resistance. Applicant solved the problem by moving the steering axis inboard of the wheel. Testing showed that this did not upset the steering dynamics of the board, however this result is highly non-obvious. For example, a similar displacement of the foot position with respect to the wheel renders the board totally unstable.

6. The combination of Yu and Namiki also lacks a key component: the torsional swivel joint in the strut connecting the two footboard assemblies. Without this refinement, the skateboard is subject to destabilizing steering torque in response to uneven tilt-pressure on the two footpads. This makes the board harder to learn and generally more unstable. The reason for this instability is actually quite complex (see discussion in previous Response filed 8/7/02). A person of "ordinary skill in the art" trying to create a 2-wheel, swivel-steering skateboard, would not have been able to distinguish this steering instability from the overall challenge of riding the skateboard.

7. Sheldon's "torsion-bar" is not suggestive since it serves an entirely different purpose: it allows the front and rear wheels to be steered independently, thus providing greater maneuverability. The present invention has independent front/rear steering already, without the need for the swivel joint. Adding the swivel joint in this case has no effect on the maneuverability, it affects only the stability and ease of use. Applicant respectfully submits that it would not have occurred to someone of "ordinary skill in the art" to add a swivel joint to the strut of the present invention.

Note also that Sheldon's "torsion-bar" does not affect the turning radius. In a hard turn, both footboards are tilted the same way, and the torsion bar provides no advantage as compared to a conventional skateboard.

8. Applicant submits that the present invention fulfills several needs which have gone largely unrecognized. Firstly, the invention is intentionally challenging. In contrast, most inventions seek to reduce difficulty. Secondly, the invention provides a novel form of movement. Many, if not most, recent skateboard inventions seek to model surfing or snowboarding. Thirdly, the invention provides great fun even on a flat surface in a confined space. Applicant submits that he can ride figure-8's in his kitchen. The trend in skateboard-type inventions has been on

devices for "extreme" stunts which often require specialized terrain (e.g. half-pipes, ramps, rails etc). A second trend has been on downhill-only devices such as snowboard-trainers and mountain-boards. Fourthly, the present invention is relatively safe since the fun of it is in intricate low-speed maneuvers. This also bucks the trend of high-speed and extreme stunts. Lastly, the invention is conducive to group games such as tag, hockey or polo on site such as a driveway or basketball court. Few skateboards in the prior art are sufficiently maneuverable to allow such games.

9. Applicant submits that the present invention has surprising, unexpected and advantageous attributes which are not suggested by the prior art. Without foreknowledge of these attributes a person of "ordinary skill in the art" would not have thought to pursue the swivel-steering/single-wheel combination.

The first surprise of the present invention is the relative ease with which a novice rider can learn to glide down a slight hill, as compared to the "Snakeboard". The reason is, that with only one wheel under each foot, the center of pressure of the foot on the footpad stays relatively centered over the wheel, thus preventing unwanted steering torque due to leg-splaying forces. This advantage is further improved by the use of the swivel-joint in the strut. A second surprise is that the present invention is more graceful and fun to ride than a "Snakeboard". This is, of course, a subjective observation, but is agreed by all who have ridden both types of skateboards.

CONCLUSION

In view of the above remarks, Applicant submits that all claims are now in condition for allowance, and such action is solicited.

Date: 1/26/2003

Respectfully Submitted,

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